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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/828,261	04/21/2004	Shuji Hirakata	119506	4840

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EXAMINER

WANG, EUGENIA

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1745

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/828,261	Applicant(s) HIRAKATA ET AL.	
	Examiner Eugenia Wang	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-12 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 4/21/04 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>4/21/04</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed April 21, 2004 has been placed in the application file and the information referred to therein has been considered as to the merits.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: S220 in figure 4. (Examiner believes this to be a typographical error, since S210 appears twice, where the second S210 is meant to be S220.) Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

4. The disclosure is objected to because of the following informalities: lines 2-3 in paragraph 0022 denote the cooling device with the reference number [26], where that reference number is given to the blower as well. Examiner believes this to be a typographical error, as the cooling device is later denoted with the reference number [30] (para 0024, line 1).

Appropriate correction is required.

5. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: Fuel Cell with Temperature Determination System and Associated Operation Method.

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1, 4, and 11 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

8. Claims 1, 4, and 11 recite the limitation "the internal temperature" in line 3. There is insufficient antecedent basis for this limitation in the claim. Changing the article "the" to 'an' is suggested.

Claim Rejections - 35 USC § 102/103

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1-9 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over US 2001/0053469 (Kobayashi et al.).

As to claim 1, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine the temperature of the fuel cell – T3, which measures cathode exhaust prior being introduced to a compressor, and T2, which measures cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is lower than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). The abnormality discovered is based off of the internal temperature of the fuel cell and would inherently pertain to something within the fuel cell (be it the stack or the temperature sensor). The driver would then be motivated to discover what the abnormality stems from, and thus the controller [4] and the alarm lamp function as an abnormality determination unit and a warning issuance unit.

Alternately, it can be interpreted that Kobayashi et al. does not specifically notify the driver of an abnormality that definitely corresponds with the temperature sensor. However, the abnormality discovered is based off of the internal temperature of the fuel cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor). The motivation for making the differentiation of what the abnormality pertains to is to give the driver more information about where the problem with the fuel cell lies. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to further differentiate between a temperature detector defect or a fuel cell stack defect in order to make malfunction determination easier on the driver.

As to claim 2, Kobayashi et al.'s system, since it has temperature sensors, a controller, which also detects abnormality, as well as a warning issuance unit (as exemplified by the warning lamp function), would be capable of being programmed in such a manner that the warm-up process (temperature maintenance operation) is stopped via controller [4] when the fuel cell operating temperature detected by temperature detector (T2 and T3 represent internal fuel cell temperature to some degree) exceeds or is equal to a second reference temperature which is higher than the first reference temperature.

It has been held that the recitation of an element is "capable" of performing a function is not a positive limitation but only requires the ability to so perform. It does not constitute a limitation in any patentable sense. *In re Hutchinson*, 69 USPQ 138.

While intended use recitations and other types of functional language cannot be entirely disregarded. However, in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art. If the prior art structure is capable of performing the intended use, then it meets the claim. In a claim drawn to a process of making, the intended use must result in a manipulative difference as compared to the prior art. In re Casey, 370 F.2d 576, 152 USPQ 235 (CCPA 1967); In re Otto, 312 F.2d 937, 938, 136 USPQ 458, 459 (CCPA 1963).

Claims directed to apparatus must be distinguished from the prior art in terms of structure rather than function. In re Danly, 263 F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). See also MPEP § 2114.

The manner of operating the device does not differentiate an apparatus claim from the prior art. A claim containing a "recitation with respect to the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus" if the prior art apparatus teaches all the structural limitations of the claim. Ex parte Masham, 2 USPQ2d 1647 (Bd. Pat. App. & Inter. 1987).

As to claim 3, Kobayashi et al. has a plurality of temperature detectors, as previously mentioned T1, T2, and T3 (fig. 1). Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line. Although the abnormality is tested in the T2 and not T3 line, apparatus taught would be capable

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of applying the abnormality test to both internal temperature indicators. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

As to claim 4, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine temperature of the fuel cell – T3, which measures cathode exhaust prior being introduced to a compressor, and T2, which measures cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. (Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line.) Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is lower than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). Although the abnormality is tested in the T2 and not T3 line, apparatus taught would be capable of applying the abnormality test to both internal temperature indicators. Additionally, the apparatus of Kobayashi et al. is also capable of continuing temperature-maintenance operation if no abnormality is detected in the remaining temperature detectors, where abnormality is determined when the temperature detectors detect a temperature equal to or less than a first reference

temperature. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

As to claim 2, Kobayashi et al.'s system, since it has temperature sensors and a controller, which also detects abnormality, would be capable of being programmed in such a manner that the warm-up process (temperature maintenance operation) is stopped via controller [4] when the fuel cell operating temperature detected by temperature detector (T2 and T3 represent internal fuel cell temperature to some degree) exceeds or is equal to a second reference temperature which is higher than the first reference temperature.

As to claims 6-10, Kobayashi et al.'s warning would signal with an abnormality of the temperature detector, where a problem in the temperature detector would inherently be indicated. However, a disconnection or short circuit is not exemplified. However, Kobayashi et al.'s system, which contains all of the components as that of the claimed invention, would be capable of having the temperature detector send a signal indicating disconnection or short-circuit to controller [4]. (See rejection of claim 2 for the Office's position on "capable" of for an apparatus claim.)

Claim Rejections - 35 USC § 103

10. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kobayashi et al. in view of US 2003/0029179 (Vander Woude et al.).

As to claim 11, Kobayashi et al. teach a fuel cell system. In fig. 1, temperature sensors are placed to determine the temperature of the fuel cell – T3, which measures cathode exhaust prior being introduced to a compressor, and T2, which measures

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cathode exhaust after being introduced to a compressor, and T1, which measures the cathode inlet. (Both T2 and T3 report the internal fuel cell temperature to some extent, as they are placed in the fuel cell exhaust line.) Fig. 4 teaches a start up warming-up method for the fuel cell (para 0081, lines 1-3). The controller judges whether the exhaust Ae at the outlet of the fuel cell of the cathode is *lower* than 20°C, if not warm-up is finished, but if so warm-up is continued (para 0083; para 0084, lines 1-3). This sort of test is performed for the air exhaust discharge from the compressor, the limit being 130°C, then warm up continues as well (para 0084, lines 10-15). Furthermore, by measuring temperatures (namely the one discharge side of the compressor), the system (via controller [4]) recognizes an abnormality and turns on an alarm lamp to inform the driver (para 0085). The abnormality discovered is based off of the internal temperature of the fuel cell and would pertain to something within the fuel cell (be it the stack or the temperature sensor).

Kobayashi et al. does not specifically teach that the abnormality detected and warning issued corresponds specifically to the temperature detector. However Vander Woude et al. teach a cryogenic temperature control apparatus and method. The system provides a plurality of temperature values to a controller (abs). Furthermore, controller [34] is programmed to accommodate failure of the sensors (para 044, lines 1-2). Vander Woude et al.'s method determines if sensors are damaged or defective – checking if the temperature sensors [45, 46] fall outside a certain range (para 0044, lines 2-7). If the sensor fails, the control apparatus [12] activates an alarm (para 0044, lines 8-10). The motivation for combining the Vander Woude et al. teaching with the

Kobayashi et al. teaching is that they address the same problem, an abnormality with a system that is dependent on temperature values. Furthermore, it would further be a motivation to provide a fuel cell system (as taught by Kobayashi et al.) that can determine whether the fuel cell stack has the problem or the temperature sensor has the problem, so that it can be fixed more easily. Therefore it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to combine the defective temperature sensor method of Vander Woude et al. with the fuel cell system of Kobayashi et al. in order to more effectively inform the user of the specific placement of a defect in the fuel cell system (specifically the temperature sensor).

As to claim 12, Vander Woude et al. teach a system where defrosting is initiated when the evaporator coil outlet temperature (ECOT) is equal to or less than -40°F (para 0053, lines 1-3). Once the defrost mode is initiated, the defrosting continues until the ECOT reaches 59°F (para 0054, lines 1-5). (Again, the art of Kobayashi et al. and Vander Woude et al. can be combined, because they are used to solve the same problem— detecting abnormality (as discussed with the claim 11 rejection). Furthermore, this mode of operation of Vander Woude et al. pertains to warming-up of a system, as is taught by Kobayashi et al.)

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Eugenia Wang whose telephone number is 571-272-4942. The examiner can normally be reached on 8 - 4:30 Mon. - Fri., EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

EW



GREGG CANELMO
PRIMARY EXAMINER

16 MAY 2009